

REMARKS/ARGUMENTS

The Examiner is thanked for the thorough examination and search of the subject.

5 Claims 163-208 are pending, wherein Claims 163-208 have been currently amended, and Claims 1-162 have been canceled.

Response to Claim Rejections under 35 U.S.C. 102 and 103

10 Applicants respectfully traverse the rejections for at least the reasons set forth below.

Response to Claims 163-178

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As currently amended, independent claim 163 is recited below:

163. A chip package comprising:

a silicon substrate;

a die;

20 an adhesive material joining a backside of said die to said silicon substrate;

a first polymer layer on a front side of said die, over a horizontal outside of said die and across an edge of said die, wherein an opening in said first polymer layer exposes a pad of said die; and

a metallization structure over said first polymer layer, over said pad, over

25 said horizontal outside and across said edge, wherein said metallization structure comprises an electroplated metal, and wherein said metallization structure is connected to said pad through said opening.

5 *Reconsiderations of Claims 163-178 rejected under 35 U.S.C. 102(e) as being anticipated by Wagner et al. (U.S. Pat. No. 5,196,377) are requested based on the following remarks.*

Applicants respectfully assert that the chip package claimed in Claim 163 patentably distinguishes over the citation by Wagner et al. (U.S. Pat. No. 6,396,148).

10 Wagner et al. teach a chip package comprising a silicon wafer 10 and a multiple integrated circuits 38 joined with the silicon wafer 10.

15 However, Wagner et al. fail to teach, hint or suggest the chip package may comprise an adhesive material joining a backside of a die to a silicon substrate, as currently claimed in Claim 163.

20 Furthermore, Wagner et al. fail to teach, hint or suggest the chip package may comprise a polymer layer on a front side of a die, over a horizontal outside of the die and across an edge of the die, as currently claimed in Claim 163.

25 Furthermore, Wagner et al. fail to teach, hint or suggest the chip package may comprise a metallization structure connected to a pad of a die through an opening in a polymer layer on the die and over a horizontal outside of the die, as currently claimed in Claim 163.

The Examiner considers that "In regard to the process recitation "electroplated" see the previously recited caselaw on product by process claims. The final product is anticipated by Wagner. There are no particular metallization physical properties claimed

to unequivocally structurally distinguish over Wagner.”. ~ See lines 2-5, in page 3, in the last Office Action mailed Jul. 13, 2007 ~

Applicants respectfully traverse the Examiner’s opinion because the
5 “electroplated” metal has a specific micro-structure that can be identified in a final product by the grain size using a TEM cross-section or by the crystal orientation using a TEM cross-section or an X-ray diffraction analysis.

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10 The structure implied by the process steps should be considered when assessing the patentability of product-by-process claims over the prior art, especially where the product can only be defined by the process steps by which the product is made, or where the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product. See, e.g., In re Garner, 412 F.2d 276, 279, 162 USPQ
15 221, 223 (CCPA 1979) (holding "interbonded by interfusion" to limit structure of the claimed composite and noting that terms such as "welded," "intermixed," "ground in place," "press fitted," and "etched" are capable of construction as structural limitations.)
~ Extracted from MPEP 2113 ~

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Under the rule on MPEP 2113, it is believed that the structure of electroplated metal implied by a process step should be considered because “electroplated” metal can be expected to impart distinctive structural characteristics to the final product in the grain size using a TEM cross-section or in the crystal orientation using a TEM cross-section or
25 an X-ray diffraction analysis.

Withdrawal of rejection under 35 U.S.C. 102(e) to Claims 163-178 is respectfully requested.

For at least the foregoing reasons, applicants respectfully submit independent Claim 163 patently distinguishes over the prior art references, and should be allowed. For at least the same reasons, dependent Claims 164-178 patently define over the prior art as well.

Response to Claims 179-196

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10 As currently amended, independent Claim 179 is recited below:

179. A chip package comprising:

 a silicon substrate;

 a die;

 an adhesive material joining a backside of said die to said silicon substrate;

15 a first polymer layer on a front side of said die, over a horizontal outside of said die and across an edge of said die, wherein a first opening in said first polymer layer exposes a first pad of said die, and a second opening in said first polymer layer exposes a second pad of said die; and

 a metallization structure over said first polymer layer, over said first and

20 second pads, over said horizontal outside and across said edge, wherein said metallization structure comprises an electroplated metal, and wherein said metallization structure connects said first and second pads through said first and second openings.

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Reconsideration of Claim 179-196 rejected under 35 U.S.C. 103(a) as being anticipated by Eichelberger et al. (U.S. Pat. No. 6,396,148) in view of Wagner et al. (U.S. Pat. No. 5,196,377) and Wachtler et al. (U.S. Pat. No. 6,707,124) is requested based on

the following remarks.

Applicants respectfully assert that the chip package claimed in Claim 179 patentably distinguishes over the citations by Eichelberger et al. (U.S. Pat. No. 6,396,148),
5 Wagner et al. (U.S. Pat. No. 5,196,377) and Wachtler et al. (U.S. Pat. No. 6,707,124).

Eichelberger et al. teach a chip package comprising a substrate 101, a die 102 joined with said substrate 101, and a metallization structure 108 over the die 102 and over the substrate 101. ~ See FIG. 1 and col. 4, lines 9-22 ~
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However, Eichelberger et al. fail to teach, hint or suggest that the substrate 101 may be a silicon substrate, as currently claimed in Claim 179.

Furthermore, Eichelberger et al. fail to teach, hint or suggest that the metallization
15 structure 108 may comprise an electroplated metal, as currently claimed in Claim 179.

Furthermore, Eichelberger et al. fail to teach, hint or suggest that the metallization structure 108 may connect two pads 107 of the die 102, as currently claimed in Claim 179.
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Wagner et al. teaches a die 38 is joined with a silicon substrate 10 after metal trace and pad 120 and 130 are formed. However, Wagner et al. fail to teach that there may be a metallization structure and a polymer layer formed over a die 38 joined with a silicon substrate 10, which goes against the purpose of Eichelberger et al.'s teaching of forming a
25 metallization structure 108 and a polymer layer 106 over a die 102 joined with a substrate 101, as shown in Fig. 1. Therefore, it is believed that the silicon substrate 10 of Wagner et al.'s device is non-analogous to the substrate 101 of Eichelberger et al.'s device.

Wachtler et al. teach a metallized plane or circuit 34 connecting two portions of a die 16, as shown in Fig. 14. Eichelberger et al. only teaches the metallization structure 108 has the function of connecting two pads 107 on different dies 102 and connecting a pad 107 to an external circuit, as shown in Fig. 2, having a different motivation from that of the metallized plane or circuit 34 in Wachtler et al.'s device. Therefore, it is believed that the metallized plane or circuit 34 in Wachtler et al.'s device is non-analogous to the metallization structure 108 in Eichelberger et al.'s device.

Withdrawal of rejection under 35 U.S.C. 103(a) to Claims 179-196 is respectfully requested.

For at least the foregoing reasons, applicants respectfully submit independent Claim 179 patently distinguishes over the prior art references, and should be allowed. For at least the same reasons, dependent Claims 180-196 patently define over the prior art as well.

Response to Claims 197-208

As currently amended, independent Claim 197 is recited below:

197. A chip package comprising:

a substrate;

a die;

an adhesive material joining a backside of said die to said substrate;

a first polymer layer on said substrate and at a horizontal outside of said die, wherein said first polymer layer has a top surface substantially coplanar with a front side of said die;

a second polymer layer on said front side, on said first polymer layer and

across an edge of said die, wherein a first opening in said polymer layer exposes a first pad of said die, and a second opening in said polymer layer exposes a second pad of said die; and

5 a metallization structure over said first and second polymer layers, over said first and second pads and across said edge, wherein said metallization structure comprises an electroplated metal, and wherein said metallization structure comprises a ground bus connecting said first and second pads through said first and second openings.

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Reconsideration of Claim 197-208 rejected under 35 U.S.C. 103(a) as being anticipated by Eichelberger et al. (U.S. Pat. No. 6,396,148) in view of Wagner et al. (U.S. Pat. No. 5,196,377) and Wachtler et al. (U.S. Pat. No. 6,707,124) is requested based on the following remarks.

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Applicants respectfully assert that the chip package claimed in Claim 197 patentably distinguishes over the citations by Eichelberger et al. (U.S. Pat. No. 6,396,148), Wagner et al. (U.S. Pat. No. 5,196,377) and Wachtler et al. (U.S. Pat. No. 6,707,124).

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Eichelberger et al. teach a chip package comprising a substrate 101, a die 102 joined with said substrate 101, and a metallization structure 108 over the die 102 and over the substrate 101. ~ See FIG. 1 and col. 4, lines 9-22 ~

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However, Eichelberger et al. fail to teach, hint or suggest that the metallization structure 108 may comprise an electroplated metal, as currently claimed in Claim 197.

Furthermore, Eichelberger et al. fail to teach, hint or suggest that the metallization structure 108 may comprise a ground bus connecting two pads 107 of the die 102, as

currently claimed in Claim 197.

Wagner et al. teaches a die 38 is joined with a silicon substrate 10 after metal trace and pad 120 and 130 are formed. However, Wagner et al. fail to teach that there may be a metallization structure and a polymer layer formed over a die 38 joined with a silicon substrate 10, which goes against the purpose of Eichelberger et al.'s teaching of forming a metallization structure 108 and a polymer layer 106 over a die 102 joined with a substrate 101, as shown in Fig. 1. Therefore, it is believed that the silicon substrate 10 of Wagner et al.'s device is non-analogous to the substrate 101 of Eichelberger et al.'s device.

Wachtler et al. teach a metallized plane or circuit 34 connecting two portions of a die 16, as shown in Fig. 14. Eichelberger et al. only teaches the metallization structure 108 has the function of connecting two pads 107 on different dies 102 and connecting a pad 107 to an external circuit, as shown in Fig. 2, having a different motivation from that of the metallized plane or circuit 34 in Wachtler et al.'s device. Therefore, it is believed that the metallized plane or circuit 34 in Wachtler et al.'s device is non-analogous to the metallization structure 108 in Eichelberger et al.'s device.

Withdrawal of rejection under 35 U.S.C. 103(a) to Claims 197-208 is respectfully requested.

For at least the foregoing reasons, applicants respectfully submit independent Claim 197 patently distinguishes over the prior art references, and should be allowed. For at least the same reasons, dependent Claims 198-208 patently define over the prior art as well.

CONCLUSION

Appl. No. 10/755,042
Amdt. dated October 22, 2007
Reply to Office action of July 13, 2007

Some or all of the pending claims are believed to be in condition for allowance. Accordingly, allowance of the claims and the application as a whole are respectfully requested.

5 Sincerely yours,



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Note: Please leave a message in my voice mail if you need to talk to me. (The time in D.C.
15 is 12 hours behind the Taiwan time, i.e. 9 AM in D.C. = 9 PM in Taiwan.)